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China's Soybean Imports Expected To Grow Despite Short-Term Disruptions

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Abstract

Rapid growth in demand for soybeans and soybean products has outstripped supply in China over the past two decades. Liberalization of production and trade policies in China has facilitated the country's boom in soybean imports, though some recent policy changes have disrupted imports. The sharp surge and sudden fall in international soybean prices during the first half of 2004 affected U.S. and South American soybean traders, as well as many Chinese soybean crushers, causing slower soybean imports. The increased imports of crude soybean oil during the last 18 months due to high demand may have prompted the Chinese government to introduce stricter standards on soybean trade. Despite short-term disruptions, China's demand for soybean and soybean products continues to look strong and provides favorable opportunities for U.S. soybean exports.

Keywords: Soybean demand, production, consumption, trade, China, soybean, soybean meal, policy changes.

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Introduction

China imported a record 20.7 million tons of soybeans in 2003 and surpassed the European Union (EU) to become the largest soybean importer in the world. Soybean import growth surged in response to growing demand for soyoil, soybean meal, and soy-based food products in China resulting from increases in income, population, and urbanization. During the 1990s, China accommodated its rising demand for soybean imports by liberalizing soybean trade as the country prepared to join the World Trade Organization (WTO). In early 2002, immediately following its accession to the WTO, China abruptly announced new biotechnology regulations that disrupted surging soybean imports. In 2004, Chinese buyers defaulted on contracts for imported soybeans after a sharp decline in soybean prices in international markets, from over \$10 a bushel in April to less than \$6 a bushel in August. These defaults have negatively affected the country's soybean imports in 2004. China's long-term imports, however, are expected to continue rising due to limited land resources, increasing population, income growth, and recent policy changes.

China's Soybean Imports Accounted for One-Third of World Soybean Trade

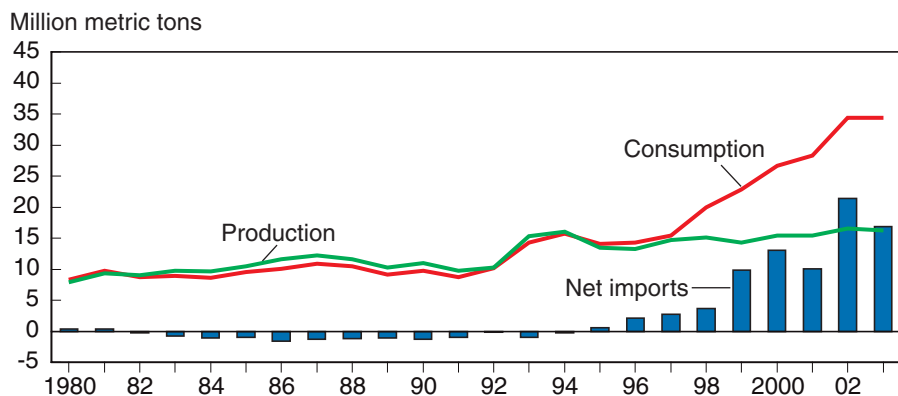
China's soybean consumption outpaced increases in domestic production during the last 25 years mainly because of increases in consumption of soybean oil and meal induced by income and population growth, particularly in large urban areas. In 2003/04, according to USDA estimates, soybean consumption in China reached more than 34.4 million metric tons, four times the volume in 1980. In response to the rapid growth in demand, China now imports about half of its total soybean consumption (fig. 1). China's soybean imports accounted for about one-third of world soybean imports in 2003.

China also has been a net importer of soyoil for about 20 years. Levels of soyoil imports were particularly high in the mid-1990s (1994-97). Imports of soyoil subsequently declined during 1998-2001 because of rapid expansion of domestic crushing capacity, before rebounding in 2002/03. The surge in soyoil imports in 2002/03 was prompted by a surplus of soybean meal as breakouts of SARS (Severe Acute Respiratory Syndrome) resulted in lower demand for meat. Outbreaks of avian flu in 2004 also dampened soybean meal demand and triggered growth in soyoil imports. Soyoil imports further strengthened in 2003/04 as high-priced imported soybeans caused negative crush margins. The anticipated impact of tightened import regulations on soyoil effective October 1, 2004, has also fueled strong soyoil imports.

China was a net exporter of soy meal prior to 1995, became a net importer from 1995 to 1999, and then regained its net exporter status in 2000 due to temporary surpluses of soybean meal (fig. 2). China's volatility in soy meal trade reflects the fact that soy meal is a joint product in the crushing process, and its availability and use are conditioned by the growth in feed demand and government policies on soyoil imports.

Figure 1

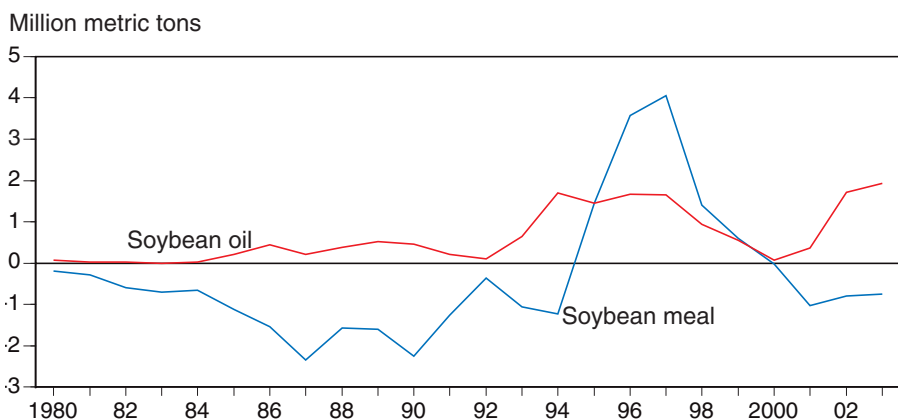
China's soybean consumption and net imports have risen steadily since 1996



Source: USDA, Production, Supply and Distribution database.

Figure 2

China's soymeal and soybean oil net imports have fluctuated considerably in the last decade



Source: USDA, Production, Supply and Distribution database.

Rising Incomes, Urbanization, and Population Growth Stimulate Demand

Unprecedented growth in demand has driven China's increasing reliance on soybean imports. Since China instituted economic reforms in the late 1970s, its economy has grown 7-8 percent annually and urban population growth has averaged 4.6 percent annually. Increased income, population growth, and urbanization in China helped propel the growth in demand for animal protein products and vegetable oils. Soybean demand derives from increased consumption of soybean oil and soybean meal. Soymeal is mainly fed to livestock, and its demand derives from demand for meat and other animal products, including fish.

Urban per capita consumption of vegetable oils in China increased from 5.8 kilograms in 1985 to 9.2 kilograms in 2003. Rural consumption of vegetable

oil grew to 7.5 kilograms per person in 2002. Historically, rapeseed oil was the leading vegetable oil consumed in China, but soybean oil consumption grew rapidly and surpassed rapeseed oil consumption in 2002. Rapeseed production competes in land use with winter wheat production, and its acreage could not be vastly expanded, precipitating its decline in importance. Soybean oil consumption also grew faster than consumption of other types of vegetable oils, including peanut oil, cottonseed oil, sesame oil, and palm oil.

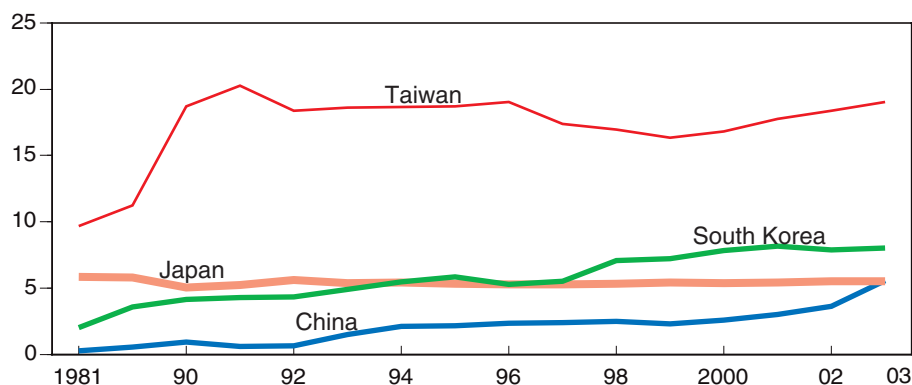
Per capita vegetable oil consumption in China has increased considerably since 1979 because of rapid income growth. This growth is expected to continue because China's current per capita consumption levels are still relatively low when compared with consumption in South Korea and Taiwan, where incomes are greater and diets are similar to those in China. Currently, per capita consumption of soybean oil in China is only about 30 percent of consumption in Taiwan. Per capita consumption of soybean oil in China increased sharply from 0.25 kg in 1981 to 5.57 kg in 2003 (fig. 3). China's 2003 level is similar to the level in Japan (5.53 kg) but is significantly lower than the levels in Taiwan (19.05 kg) and South Korea (8.01 kg).

Major factors contributing to the greater demand for soymeal in China are income growth and urbanization, which have shifted the food mix away from starchy staple grains toward higher protein livestock products and fish. The growth in soymeal use (in response to more efficient animal production and more consumption) has been especially rapid during the last decade. Between 1990 and 2003, per year levels of soybean meal used for feed purposes rose from 1.03 million tons to 19.6 million tons, an annual growth rate of over 25 percent. By comparison, use of corn for feed grew only 4.1 percent per year over the same period. Modifications in feed rations favoring soymeal use have led to increased protein content in livestock feed and improved animal weight gains.

Figure 3

Per capita soybean oil consumption in China is rising, but is considerably lower than in other East Asian countries

Kilograms per capita



Source: Calculated based on total soybean oil consumption from USDA Production, Supply and Distribution database and population estimates from the International Monetary Fund.

Rapid growth in soymeal use as a feed ingredient was caused not only by growth in animal production but also by changes in the production structure of the livestock industry itself. Structural changes in the 1980s and 1990s were phenomenal (Fang et al., 1999), with livestock production trending toward larger household operations (called "specialized households") that use larger proportions of soymeal in feed rations and also toward large-scale commercial operations. Traditional household operations (called "backyard feeding") that use water plants, vegetables, tubers, sweet potato leaves, carrots, pumpkins, crop stalks, and table scraps for feed purposes accounted for less than 80 percent of total pork production in recent years, compared with roughly 95 percent in the early 1980s. China's hog and poultry feeding practices are expected to gravitate even further toward large or specialized household operations and large-scale commercial operations, similar to those in developed countries, during the next decade. Strong demand for soybean meal is foreseen to continue as the expected growth in food consumption and specialization in livestock production continue to evolve.

Processing Capacity Keeps Expanding With Crushing Margins Diminishing

Soybean crushing margins, an important indicator of profitability for crushers globally (Dohlman, Persaud, and Landes, 2003), were as high as \$60 per ton in 1999 (fig. 4). These high margins stimulated investments in crushing plants, mostly in the urban areas of China's eastern and southeastern coastal provinces. Investments further boomed after the government re-imposed the 13 percent value-added tax on imported soymeal in 1999 and reduced tariffs on soybean imports to just 3 percent. Total crushing capacity reached 45 million metric tons in 2001 and grew to a reported 60 million metric tons by the end of 2003 (NGOIC, 2004). Many major crushing plants in Heilongjiang, Shandong, Jiangsu, Guangdong, and Sichuan provinces expanded during the period.

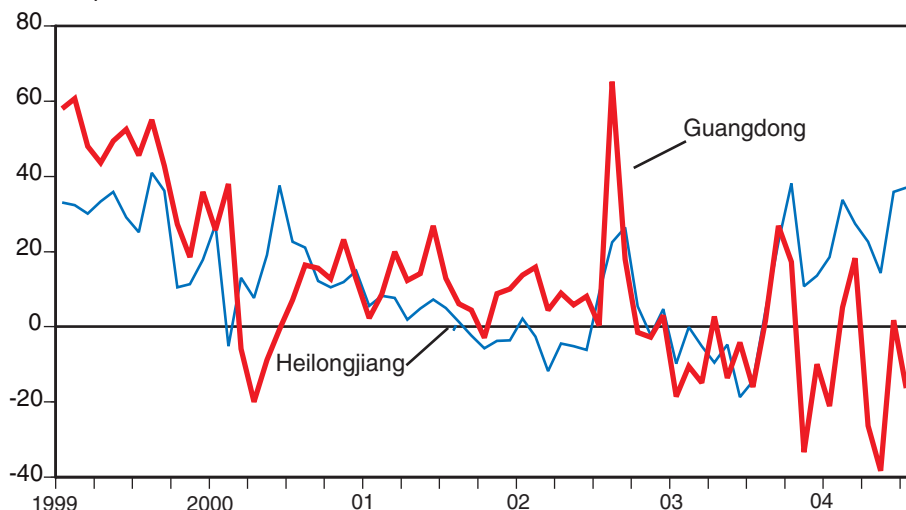
Capacity, however, grew faster than production, and competition in the industry reduced profit margins for domestic crushers. Margins were negative throughout much of 2003, and in the first 7 months of 2004 due to high soybean prices, intense competition, and depressed prices for oil and meal. Furthermore, an outbreak of avian flu dampened demand for soybean meal, and tightening of credit to cool the economy reduced the supply of capital available to finance imports. Many Chinese crushers had contracted for soybean purchases when international prices peaked at around \$10 a bushel in April 2004. When deliveries were actually to be taken in June, July, and August, prices had fallen to \$6 a bushel or even lower. Many importers, not having hedged their purchases with futures contracts, therefore opted to default on contracts rather than absorb additional losses. Imports were further interrupted when China's quarantine and inspection service subsequently discovered beans treated with banned fungicides in shipments from Brazil and rejected a number of shipments. Imports fell sharply in April and May and millions of dollars in soybean contracts were in dispute.

During the second half selling to the market. Thus, Chinese imports are likely to rebound by the end of 2004 or early 2005 when lower soybean prices will boost crush margins.

Figure 4

Soybean crushing margins in Heilongjiang and Guangdong provinces have been trending downward between 2000 and 2004

Dollars per metric ton



Source: China's National Grain and Oils Information Center. Heilongjiang and Guangdong wholesale market prices for oil and meal and Gulf prices for soybeans were used in the calculation. China's soybean crushing margin at Heilongjiang markets (dollars/metric ton) assumed an oil extraction rate of 16 percent and meal of 81 percent with 3 percent waste; factory cost is \$16. China's soybean crushing margin at Guangdong markets (dollars/ton) assumed an oil extraction rate of 18 percent and meal of 79 percent with 3 percent waste; factory cost is \$14. Exchange rate used is 1 US \$ = 8.28 yuan.

Limited Land Resources, Low Yields of Soybean Production Impede Domestic Supply

China's food use of soybeans, estimated at 8-10 million tons of domestic production, continued to expand in recent years. Given its limited arable land and slow growth of soybean yields—currently about 35 percent lower than U.S. average yields—China faces difficulties in improving its domestic supply of soybeans and maintaining a competitive edge vis-à-vis imported soybeans. Soybean production in China has increased significantly over the last two decades, but not enough to keep pace with demand. Annual soybean production increased from 8.9 million tons during 1979-84 to 14.4 million tons during 1995-2000, a result of the growth in yields and area devoted to production. In 2003, China produced 15.4 million tons of soybeans, or 9 percent of the world's total soybeans, but its share of world demand rose to 18 percent and China thus became the largest soybean importer. In contrast, the United States produced 35 percent of the world's soybean output in 2003 and was the World's largest soybean exporter.

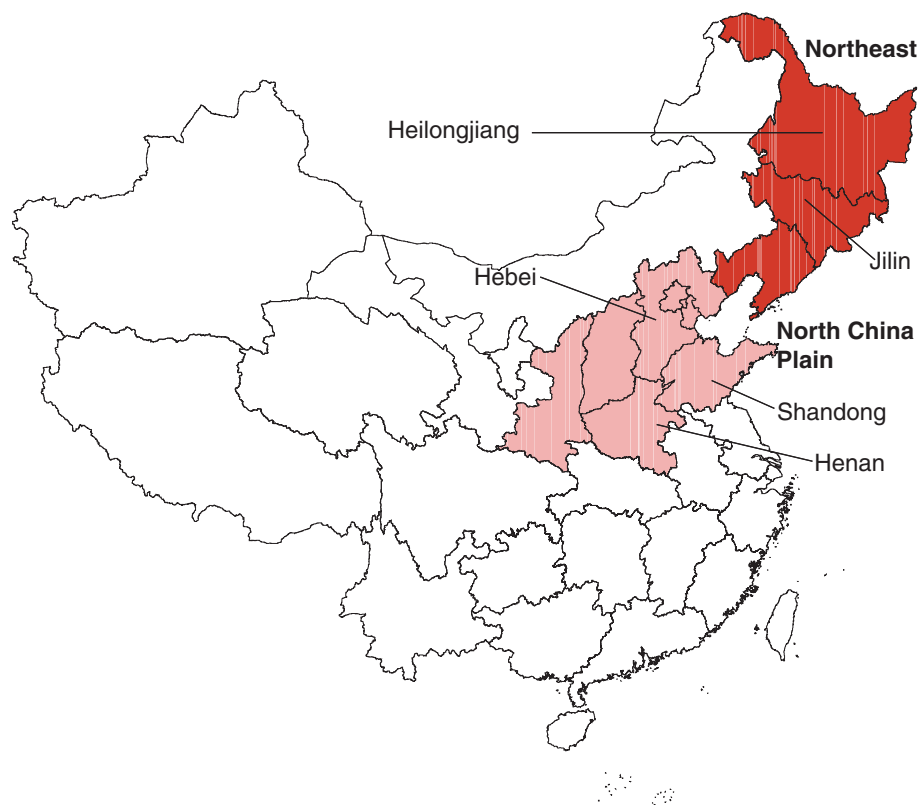
Soybean production in China is concentrated in the Northeast (Heilongjiang and Jilin) and North China Plain (Shandong, Henan, and Hebei) (fig. 5). These two regions together produce about 60 percent of China's soybeans. The North China Plain is largely a double-crop region, and its summer-grown soybean output is crippled by low yields due to a short growing season. It would be neither agronomically feasible nor economically prac-

tical to substitute two crops—mainly winter wheat and summer corn, or cotton—for a single crop of soybeans sown in the spring. Soybean output therefore can only be significantly expanded if China shifts large areas of corn or spring wheat in the Northeast region into soybean production.

Historically, corn has been a more profitable crop than soybeans in the Northeast, though this trend has reversed during the last couple of years. According to China's rural statistics yearbook published by China's National Statistical Bureau, corn production in 2002 yielded an estimated profit of 79 yuan (1U.S.\$=8.2 yuan) per mu (1/15 hectare), compared with 121 yuan for soybeans. Similarly, results from early planting surveys conducted by China's Ministry of Agriculture indicated that in the Northeast region, soybean production yielded an estimated profit of 222 yuan per mu in 2003, compared with 110 yuan for corn (China's Ministry of Agriculture, 2004). Thus, changes in the relative profitability of corn vis-à-vis soybeans will be a crucial long-term determinant of how many soybeans China produces and imports. But, it is worth noting that increased profitability in growing soybeans alone has not necessarily translated into increased production. In 2003, areas sown to soybeans expanded, but this increase in acreage did not lead to a larger crop because of extremely bad weather. Early planting surveys indicate that areas planted to soybeans increased in 2004, but how such increases will affect production and imports is still uncertain. In addition, total increases in soybean areas in 2003 and 2004 were insignificant when

Figure 5

China's major soybean-producing regions



Source: Economic Research Service.

compared with China's entire total soybean areas. Jilin province reportedly has the biggest potential to expand area sown to soybeans within the next 5 years, but the targeted expansion may only be about half a million hectares. Half a million hectares translates to about 1 million tons of soybean output, which is equivalent to 2-3 weeks of imports currently or 1-2 weeks of imports within 5 years.

Transportation Impediments and Quality of Imported Soybeans Influence Location of Crushing

The quality of imported soybeans and the availability of infrastructure needed to transport the beans also affect soybean trade and the location of crushing plants. Soybeans produced in the Northeast still compete with imported soybeans in eastern and southern China, where much of China's new crushing facilities have been built. However, crushers in the southern and eastern coastal provinces, and even some in the Northeast, prefer imported U.S. beans because they are often less expensive and have a higher oil content (by 1 percent) than China's domestic beans. Crushers also like the consistent quality of imported beans and the reliability of delivery dates.

Transportation bottlenecks in the Northeastern region compromise the reliability of domestic bean shipments, which also makes imported soybeans attractive to crushers. Every year from October to February, rail cars are diverted from other uses to transport coal from northeastern China to meet demand for heating fuel in southern China, leaving fewer cars available for transporting soybeans and other commodities, such as corn and rice. Although actual soybean demand in any given year varies according to railway congestion and governmental priorities, high transportation expenses for soybeans undoubtedly make domestic beans less competitive in southern China. Commodity traders in China reported that the cost of transporting soybeans and corn from the Northeast to the South within China is sometimes comparable to the cost of transporting them from the United States. According to recent Ministry of Agriculture reports, this issue may not be resolved in the next 4 or 5 years. Therefore, development of transportation infrastructure will be a major determinant of the extent to which domestic soybeans are displaced by imports.

Changes in Trade Policies Since the Mid-1990s Facilitated Soybean Imports

China has pursued a variety of policies during the last decade that have affected soybean and soybean product trade. Some of these policies have facilitated trade, while others—especially several recent short-term measures—have impeded imports.

China liberalized soybean and soybean product trade, a measure that contributed to the long-term growth in soybean imports. In the mid-1990s, in anticipation of its accession to the WTO, China reduced soybean tariffs to 3 percent, and the 2001 WTO accession agreement prevented the government from raising tariff rates in response to domestic pressures. Also, China

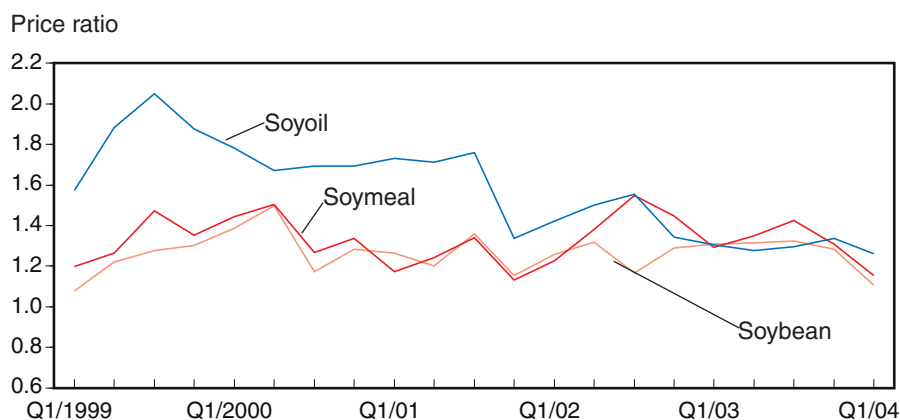
decontrolled soyoil imports by replacing the pre-2001 state trading monopoly, import quotas, and licensing with tariff-rate quotas (TRQs) for imported soybean oil that increased each year (although imports of soyoil in the past 2 years were less than TRQ levels). Sixty-six percent of the soyoil quota was reserved for nonstate traders for 2002, and the nonstate share rises to 90 percent in 2005. This measure, along with China's reductions in over-quota tariffs to 9 percent in 2005 from 48 percent in 2002, has facilitated imports of soyoil. China's soyoil imports rose to 1.9 million tons in 2003—an increase of more than 116 percent over the previous year—and 1.6 million tons in the first 7 months of 2004. Soymeal imports are not subject to TRQs, but tariffs are bound at a nominal 5 percent.

As a result of the reduction in trade barriers, domestic prices of soybeans and soy products in China are more closely aligned with world prices. In 1999, prices of soybean oil in Heilongjiang and Guangdong provinces were 60-100 percent higher than world prices. In 2003, Guangdong soyoil prices were only 30-40 percent above world levels (fig. 6). This convergence between domestic and world prices is likely to continue as China further integrates itself into the world market and removes long-term impediments to trade.

The Chinese Government has also imposed a value-added tax (VAT) to manage soybean and soybean product trade. For example, the government lifted the 13-percent VAT on imported soymeal in 1995 to spur the growth of the livestock sector (Hsu, 2001). Consequently, soymeal imports surged to 1.9 million tons in 1996 and were as high as 4.2 million tons in 1998. The surge of imports, however, depressed prices, and domestic crushers cut back production. Production cutbacks, in turn, led to a shortage of soyoil, and, because imports were restricted by the government, smuggling of edible oils skyrocketed, peaking in the summer of 1998. To correct the imbalances, China re-

Figure 6

Domestic soybean and soybean product prices (Guangdong Province) have been converging with world prices during 1999-2004



Note: Chart shows ratio of Guangdong price to world price for each commodity.

Source: Calculated by authors using data from China's National Grain and Oils Information Center.

imposed the 13-percent VAT on all imported soymeal in July 1999. In response, imports of soymeal fell, prices rose, and crushing margins increased, stimulating imports of unprocessed soybeans as opposed to soybean products. Consequently, soybean imports surged beginning in 2000, and China's soybean crushing capacity grew rapidly.

China also reimbursed the 13-percent VAT to its exporters of soymeal in 2004 in response to persistent domestic surpluses in 2002 and 2003. This policy was an extension of the measure that China first introduced in 2001 to encourage exports of grain products (Gale, 2002). In addition, China waived railroad construction taxes levied on transporters of soymeal to enhance the competitiveness of Chinese meal exports. Reimbursement of railroad construction taxes for soymeal was retroactive to January 2002, according to the Chinese government. Although China never published information on the magnitude of the reimbursement, this policy temporarily facilitated export of surplus soymeal in 2002 resulting from slower growth in the livestock sector and, reportedly, stagnant household expenditures on food items. Soymeal exports slowed in 2003 when the domestic livestock sector increased its feed demand. In 2004, to revive soymeal demand dampened by the effects of outbreaks of SARS and avian flu, China's government implemented policies designed to increase soymeal exports to neighboring countries by rebating the VAT.

Biotechnology Regulations and New Standards on Soybean Imports Disrupt Trade

Several regulations and standards instituted by the Chinese government in recent years have impeded soybean and soybean product trade. Shortly after its accession to the WTO in 2001, China announced its first set of biotechnology and food safety regulations. These regulations require testing and labeling of all food products containing biotech ingredients and stipulate that the approval process for an application for a safety certificate for imports of biotech soybeans may take as long as 270 days. The regulations also state that each shipment of biotech soybeans needs an individual safety certificate. Initially, the regulations interrupted deliveries, reducing China's soybean imports between April and June 2002 (fig. 7). But China issued temporary import permits, and soybean imports subsequently rebounded and were not seriously interrupted during the rest of 2002 and throughout 2003. China imported a record 20.7 million tons of soybeans in 2003.

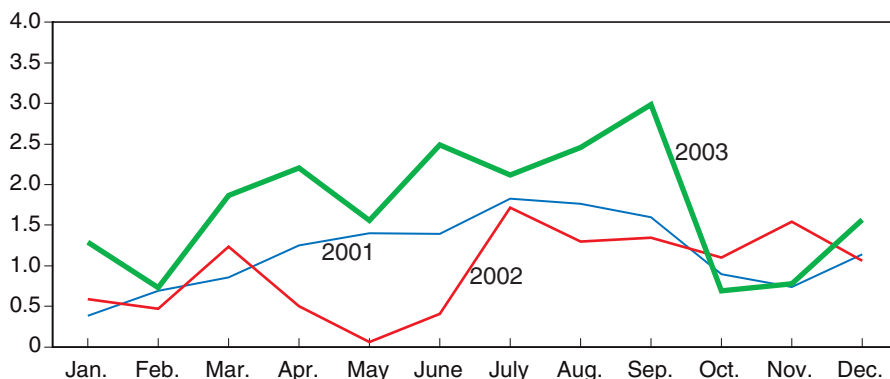
Imports of soybeans were governed by the issuance of temporary import certificates until March 2004, when the Chinese Ministry of Agriculture granted a permanent safety certificate for importing Monsanto herbicide tolerant biotech soybeans. Despite the approval, import permits are still needed for each shipment, and the permanent safety certificate is subject to review after 5 years. Soybean shipments could be interrupted by the denial of import permits or the revocation of the safety certificate. The approval only allows the importation of biotech soybeans and does not permit domestic production of any genetically modified soybeans. The new regulations still leave open the possibility of future disruption of imports.

China also recently announced new regulations for soybean imports. The soybean regulation was published in November 2003 and was initially to take

Figure 7

China's monthly imports of soybeans, 2001-03

Million metric tons



Source: China's Customs Administration.

effect May 1, 2004, but implementation was postponed to October 1, 2004. The soyoil regulation stipulates the maximum levels of solvent residue of crude soybean oil, pressing finished product of soybean oil, and solvent extraction finished product of soybean oil. Exporters are concerned that the new standards are excessively rigid on crude soybean oil and that the potential exists for all shipments to be blocked from entry if a few cargoes exceed the standards. Some exporters believe that the new regulations are aimed at controlling crude soyoil imports, which surged during late 2003 and 2004, weakening soyoil prices and contributing to the financial crisis in China's crushing industry. The new standards on maximum solvent residue may generate some contentious issues that could potentially disrupt crude soyoil imports into the country.

Reemphasized Food Security Policy Ensures Continued Soybean Imports in Future Years

In 2004, China reemphasized its commitments to long-term food security by announcing measures that would encourage food grain production and likely crowd out domestic soybean production. This policy reversed campaigns in 2002 and 2003 to boost soybean production, mainly in Heilongjiang and Jilin provinces. Indeed, the policy initiatives undertaken by China's Ministry of Agriculture this year even tried to cap the areas for planting soybeans in the Northeast and only took limited efforts to increase yields.

The new policy provides subsidies directly to grain producers and reduces agricultural taxes (averaging 8 percent of annual output value) in 2004. Direct subsidies are unprecedented in China's agricultural history. Historically, Chinese farmers have been taxed, while consumers and processors were subsidized (Tuan and Cheng, 1999; Tian et al., 2002).¹ The details of the direct payment program are not yet clear, but they are likely to discourage soybean production because the subsidies are mainly targeted to

¹Beginning in the 1990s, agriculture was indirectly subsidized through government grain marketing bureaus, but little of the money reached farmers.

grain producers. China has also eliminated taxes on specialty crops, except tobacco, thus making them relatively more profitable to cultivate than soybeans. In 2004, China gave subsidies of 10 yuan per mu to soybean farmers in the Northeast region for purchase of seeds with higher oil content and greater yield potential, but these subsidies were limited to a small portion of the soybean farms in the region.

China's reemphasized focus on food security for grains is a response to both declining output of food grains and slow growth in farm household net income. This renewed focus is designed to spur food grain production and discourage soybean cultivation. Thus, this policy change suggests that China's growing demand for soybean and soybean products can only be satiated with continued increases in imports.

Conclusions

China, once the world's largest soybean-producing country, now relies on imports from the United States, Brazil, and Argentina for half of its soybean use. Although China was able to double its domestic soybean production over the last two decades, total soybean use far outstripped this increase in production. China's food use of soybeans has grown continuously and now accounts for more than half of its domestic output. Strong demand for soyoil and soymeal stimulated China's imports of soybeans in recent years. China's annual soybean imports surpassed 10 million tons in 2001 and surged to over 20 million tons in 2003, making China the largest soybean importer in the world.

Since the 1990s, China has gradually liberalized its agricultural trade policy, but China's biotechnology and food safety regulations periodically disrupt imports of soybeans and soybean products. Other policies, such as tax waivers, are used to promote exports of soymeal. The Chinese government has sought to boost soybean production in the last couple of years, but new policies favor production of grain over soybeans. With limited production capacity, China's continued growing demand for imports of soybean and soybean products provides favorable opportunities for U.S. soybean exports in the long-run, although short-term policy changes may complicate matters.

References

- China's Customs Administration. *China's Customs Statistics Monthly*, various issues.
- China's Ministry of Agriculture, Information Center. Website (in Chinese), 2004.
- China's National Grain and Oils Information Center (NGOIC). Daily reports (in Chinese), 2004.
- China's National Statistical Bureau. *China Statistical Yearbook, 2003*, China Statistics Press, Beijing, China, September 2003.
- Dohlman, Erik, Suresh Persaud, and Rip Landes. *India's Edible Oil Sector: Imports Fill Rising Demand*, Report OCS-0903-01, U.S. Department of Agriculture, Economic Research Service, November 2003, <http://www.ers.usda.gov/publications/OCS/nov03/ocs090301/>
- Fang, Cheng, and Jay Fabiosa. *Does the U.S. Midwest Have a Cost Advantage Over China in Producing Corn, Soybeans, and Hogs?* MATRIC Research Paper 02-MRP 4, Midwest Agribusiness Trade Research and Information Center, Iowa State University, August 2002.
- Fang, C., F. Fuller, M. Lopez, and F. Tuan. "Changes of Livestock Feeding in China: With Emphasis on Hogs," *International Agriculture and Trade Report: China, Situation and Outlook*, WRS-99-4, U.S. Department of Agriculture, Economic Research Service, March 1999, <http://usda.mannlib.cornell.edu/reports/erssor/international/wrs-bb/1999/china/>
- Flaskerud, George. *Brazil's Soybean Production and Impact*. North Dakota State University, Extension Service, EB-79, July 2003, <http://www.ext.nodak.edu/extpubs/plantsci/rowcrops/eb79.pdf>
- Gale, Fred. *China's Corn Exports: Business as Usual, Despite WTO Accession*, Report FDS1202-01, U.S. Department of Agriculture, Economic Research Service, December 2002, <http://www.ers.usda.gov/publications/fds/dec02/fds1202-01/fds1202-01.pdf>
- Hsu, Hsin-Hui. "Policy Changes Continue To Affect China's Oilseed Trade Mix," *China: Agriculture in Transition*, Agriculture and Trade Report WRS-02-2, U.S. Department of Agriculture, Economic Research Service, November 2001, <http://www.ers.usda.gov/publications/wrs012/wrs012h.pdf>
- Plato, Gerald, and William Chambers. *How Does Structural Change in the Global Soybean Market Affect the U.S. Price?* Report OCS-04D-01, U.S. Department of Agriculture, Economic Research Service, April 2004, <http://www.ers.usda.gov/publications/ocs/apr04/ocs04d01/ocs04d01.pdf>
- Schnepf, Randall D., Erik Dohlman, and Christine Bolling. *Agriculture in Brazil and Argentina: Developments and Prospects for Major Field Crops*, Agriculture and Trade Report WRS-01-3, U.S. Department of Agriculture, Economic Research Service, December 2001, <http://www.ers.usda.gov/publications/wrs013/>

- Tian, Weiming, Zhang Liqing, and Zhou ZhangYue. "Experience and Issues in Measuring the Level of Agricultural Support in China," *Agricultural Policies in China After WTO Accession*, Emerging Transition Economies, Organization for Economic Cooperation and Development, Paris, 2002.
- Tuan, Francis C., and Guoqiang Cheng. "A Review of China's Agricultural Trade Policy," Invited paper presented at the IATRC Summer Meeting on China's Agricultural Trade and Policy: Issues, Analysis, and Global Consequences, San Francisco, June 25-26, 1999.
- U.S. Department of Agriculture, Foreign Agricultural Service. *China, Peoples Republic of Oilseeds and Products Policy Announcement for Domestic Soybean Industry*, GAIN Report CH3016, 2003.
- U.S. Department of Agriculture, Foreign Agricultural Service. Production, Supply and Distribution database, <http://www.fas.usda.gov/psd/>
- World Perspectives, Inc. Ag Perspectives Daily Reports, 2004.